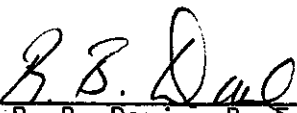


FEASIBILITY STUDY

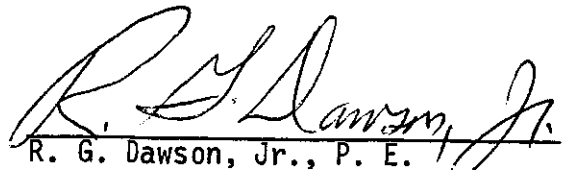
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Durham
Interchange Revisions
Blackwell Street at the Buck Dean Freeway
Durham County
FS-890002

Prepared by
Planning and Research Branch
Division of Highways
N. C. Department of Transportation

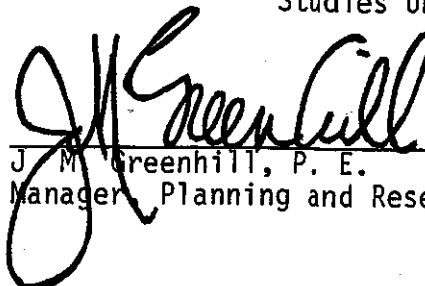


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I. GENERAL DESCRIPTION

This report covers possible interchange revisions on the Buck Dean Freeway in the vicinity of Blackwell Street in downtown Durham (see Figures 1 and 2). The studied revisions, which involve the removal of three existing ramps and the addition of two new ramps to the interchange-frontage road complex serving downtown Durham, were requested by the City of Durham's Traffic Engineering Department to provide direct access to Blackwell Street and adjacent areas that are being considered for redevelopment into high traffic generation uses.

II. EXISTING CONDITIONS

The Buck Dean Freeway is a major east-west traffic artery in Durham. It connects many of Durham's major traffic generators such as the central business district, Duke University, and the Duke Medical Center - V. A. Hospital area with each other and via the North-South Freeway to I-40 and the Research Triangle Park on the east, and upon its completion, will connect to I-85 on the west. Blackwell Street is major north-south street serving the former American Tobacco plant and central business district. The Buck Dean Freeway is designated a Major Thoroughfare-Freeway on Durham Thoroughfare Plan and Blackwell Street is designated a Minor Thoroughfare on this plan.

The portion of the freeway in the study area was the first segment of the freeway built, opening to traffic in 1970. Downtown Durham is served by the Roxboro-Mangum and Duke-Gregson one-way pairs, Chapel Hill Street, and Blackwell Street through a system of ramps and frontage roads paralleling the freeway. The access between Blackwell Street and the freeway is indirect. Westbound vehicles destined for Blackwell Street must exit the freeway east of Roxboro Street and travel through two signalized intersections before reaching Blackwell Street. Eastbound traffic has an even less direct access, having to exit just beyond Blackwell Street, continue eastward to Roxboro Street, cross the freeway and then return two blocks to Blackwell Street.

III. PURPOSE OF PROJECT

The primary purpose of the project is to improve access to Blackwell Street from the Buck Dean Freeway. The addition of the two exit ramps from the freeway shown on Figure 2 will provide this improved access. These ramps will provide direct access from the freeway without the necessity of going through additional at-grade intersections or having to travel out of direction. For westbound travellers, it will also eliminate the present problem of having to exit well before the destination comes into sight.

The improved access to Blackwell Street should greatly enhance the redevelopment potential of the former American Tobacco complex located between Blackwell and Carr Streets. It will also provide more direct access to the potential site for the new Durham Bulls Baseball Park located to the west of Carr Street. However, with this design, ballpark

traffic would have to exit the freeway near Mangum Street before the stadium is in sight, and the existing Duke Street exit, which is in view of the site, would be eliminated.

IV. TRAFFIC OPERATIONS

The changes to the ramp and frontage road system shown on Figure 2 will have a tremendous impact on traffic operations. These changes consist of the addition of new exit ramps from both the eastbound and westbound lanes of the freeway to Blackwell Street, the removal of the exit ramp from the freeway to Duke Street, the removal of the entrance ramp from Mangum Street to the freeway, the removal of the Parker Street ramp from Gregson Street to the freeway, and elimination of two-way operation on Morehead Avenue between Blackwell Street and the new exit ramp. The traffic impact of these changes can be seen by comparing Figure 3 (the projected traffic volumes with the existing street system) to Figure 4 (the projected traffic volumes with the proposed changes).

The construction of the two new ramps would improve the access to Blackwell Street from the freeway; however, the closing of the three existing ramps would reduce the access between the freeway and Mangum Street, Duke Street, and Gregson Street. Each of these adversely affected streets is designated a Major Thoroughfare in the Durham Thoroughfare Plan. The removal of the entrance ramp from Mangum Street to the freeway would require the present 4300 vehicles per day (vpd) desiring to enter here to travel to Duke Street for access to the freeway. This traffic would be required to travel on additional 0.35 mile on surface streets through two congested intersections, before reaching the Duke Street entrance ramp. This additional volume would more than quadruple the volumes utilizing this ramp resulting in a future volume of 9600 vpd on the ramp. The closing of the Duke Street exit ramp would require traffic destined for Duke Street (4800 vpd existing) to utilize the new Blackwell Street ramp and travel through the busy Blackwell Street intersection. The addition of traffic desiring to exit onto Duke Street along with the traffic desiring to enter from Mangum Street to the traffic already utilizing the frontage road will result in congestion at the Blackwell Street intersection. As traffic volumes continue to grow, the operation of this intersection will continue to worsen, deteriorating to Level of Service F by the design year. This will result in delays to motorists who would not be delayed if the present design is retained.

The removal of the Parker Street ramp from Gregson Street to the freeway will necessitate the rerouting of the traffic currently using this ramp down Morehead Avenue. Motorists using Morehead Avenue would have to travel through five signalized intersections before reaching the entrance ramp east of Roxboro Street, adding considerable delay to vehicles desiring to make this move.

Changing Morehead Avenue to one-way operation between Blackwell Street and the new ramp will have an adverse effect on access to Morehead Avenue west of Blackwell Street and especially to the large retirement home located in the southeast quadrant of the Duke Street-Morehead Avenue intersection. In addition to making access more circuitous for residents

and visitors to the home, it will require the rerouting of fire trucks and other emergency vehicles over longer routes than are now necessary.

V. COST

The estimated costs of adding the two new Blackwell Street ramps and the related construction shown of Figure 2 are as follows:

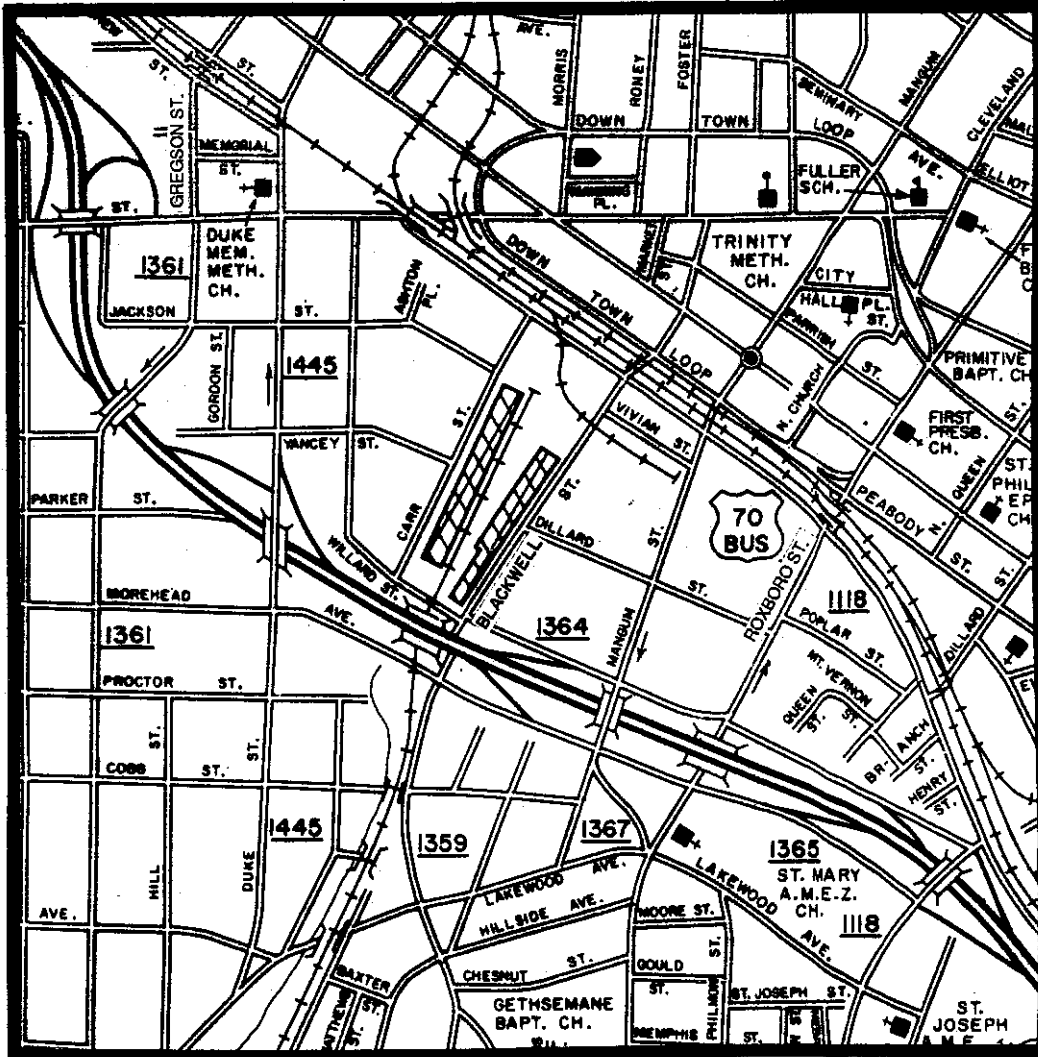
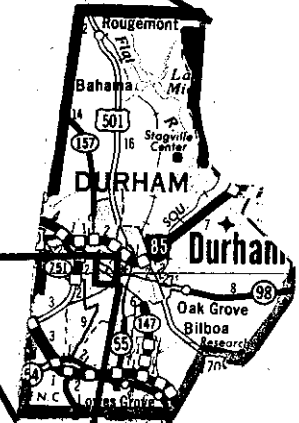
Construction	\$1,250,000
Right-of-Way	<u>750,000</u>
TOTAL	\$2,000,000

Construction costs include engineering and contingencies and right-of-way costs include acquisition and utility costs.

VI. RECOMMENDATIONS

It is recommended the existing roadway network be retained. The roadway changes necessitated by the addition of the Blackwell Street ramps would result in worse overall traffic operations on the ramp-frontage road system linking the Buck Dean Freeway with downtown Durham. The expenditure of \$2,000,000 for a less efficient highway system is not justified.

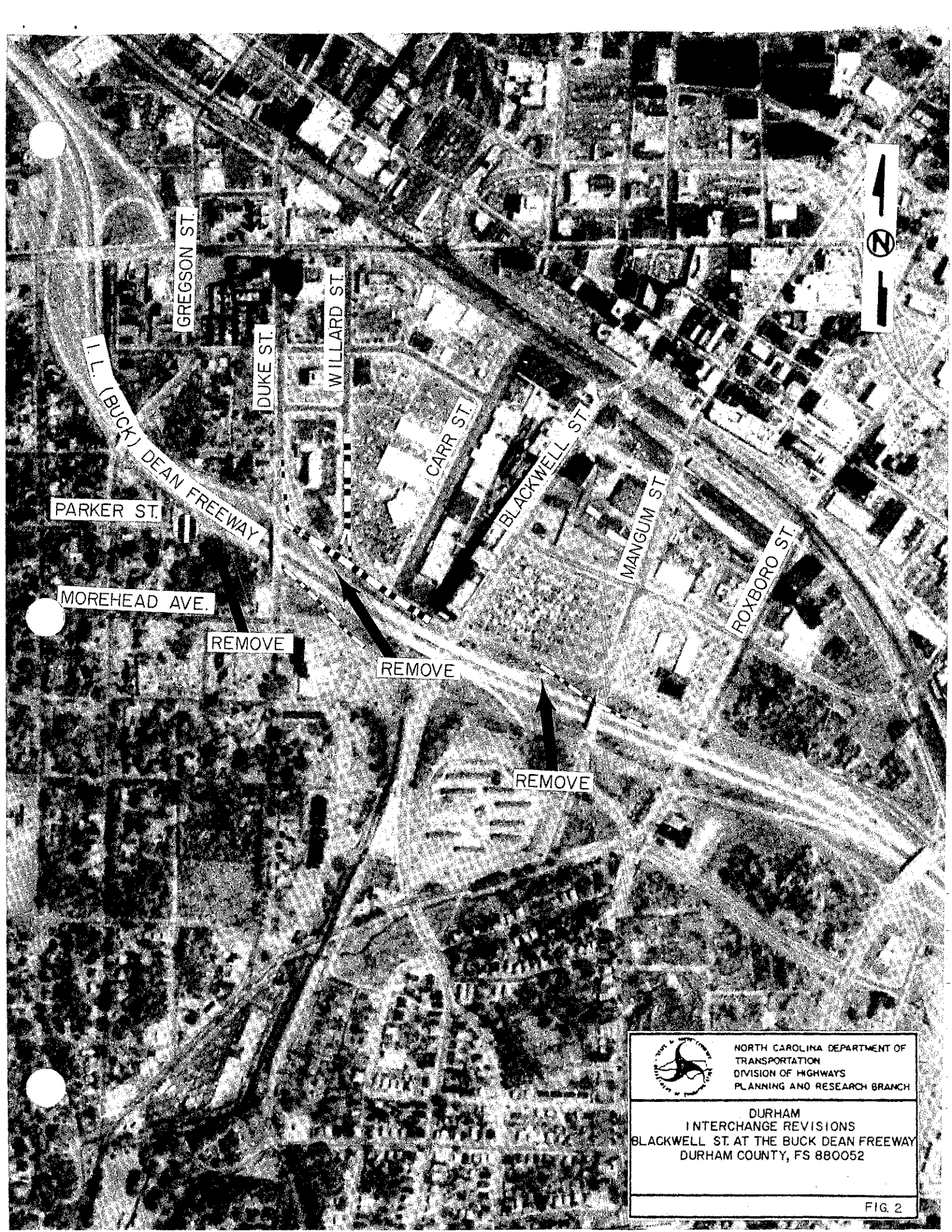
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NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

DURHAM
INTERCHANGE REVISIONS
BLACKWELL ST. AT THE BUCK DEAN FREEWAY
DURHAM COUNTY, FS 880052

FIG. 1





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FIG. 2

DURHAM, BUCK DEAN FREEWAY
ESTIMATED TRAFFIC VOLUMES WITH EXISTING DESIGN
1990/2010 ADT IN HUNDREDS

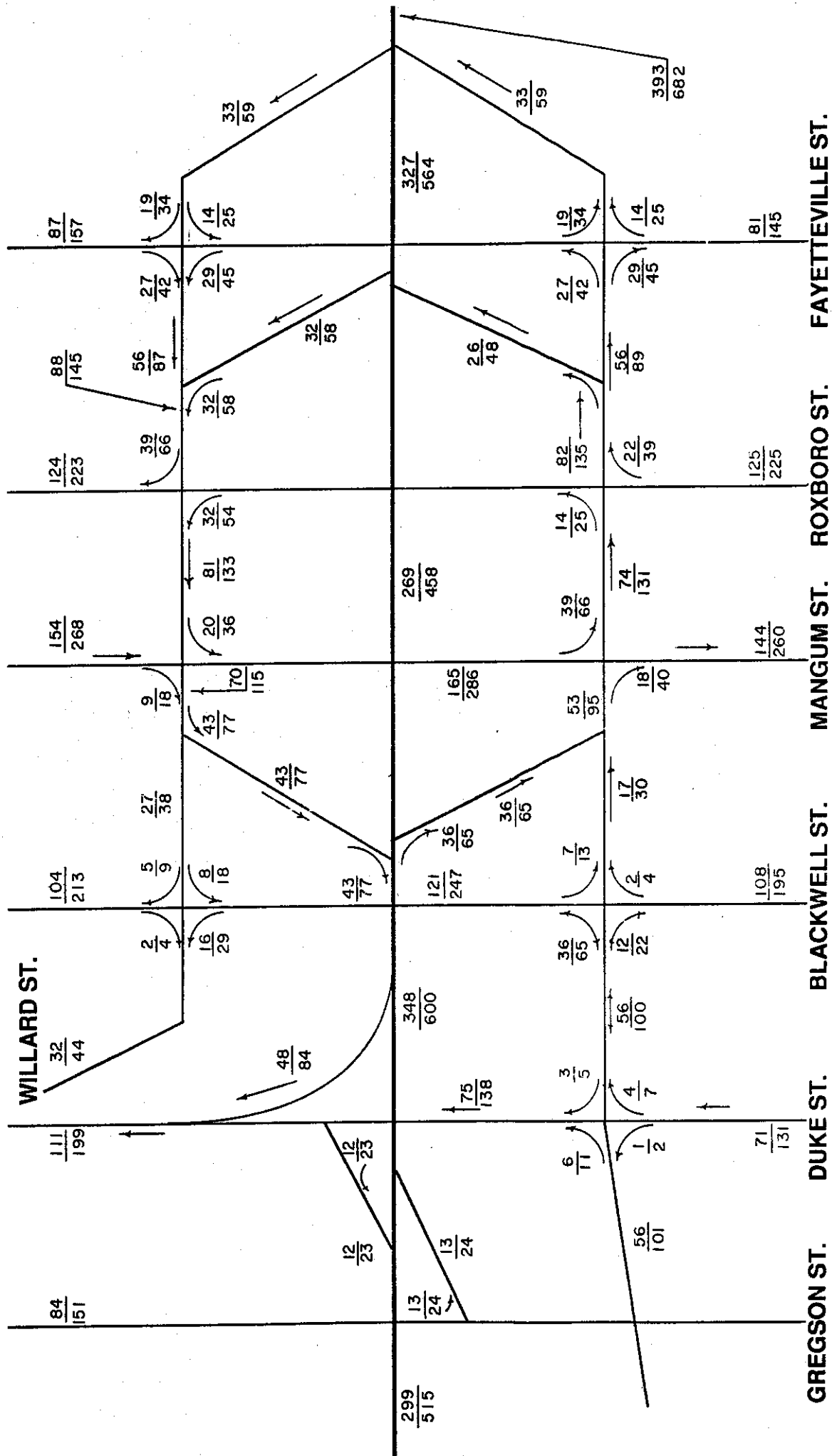


FIG. 3

DURHAM, BUCK DEAN FREEWAY
ESTIMATED TRAFFIC VOLUMES WITH PROPOSED INTERCHANGE REVISIONS
1990/2010 ADT IN HUNDREDS

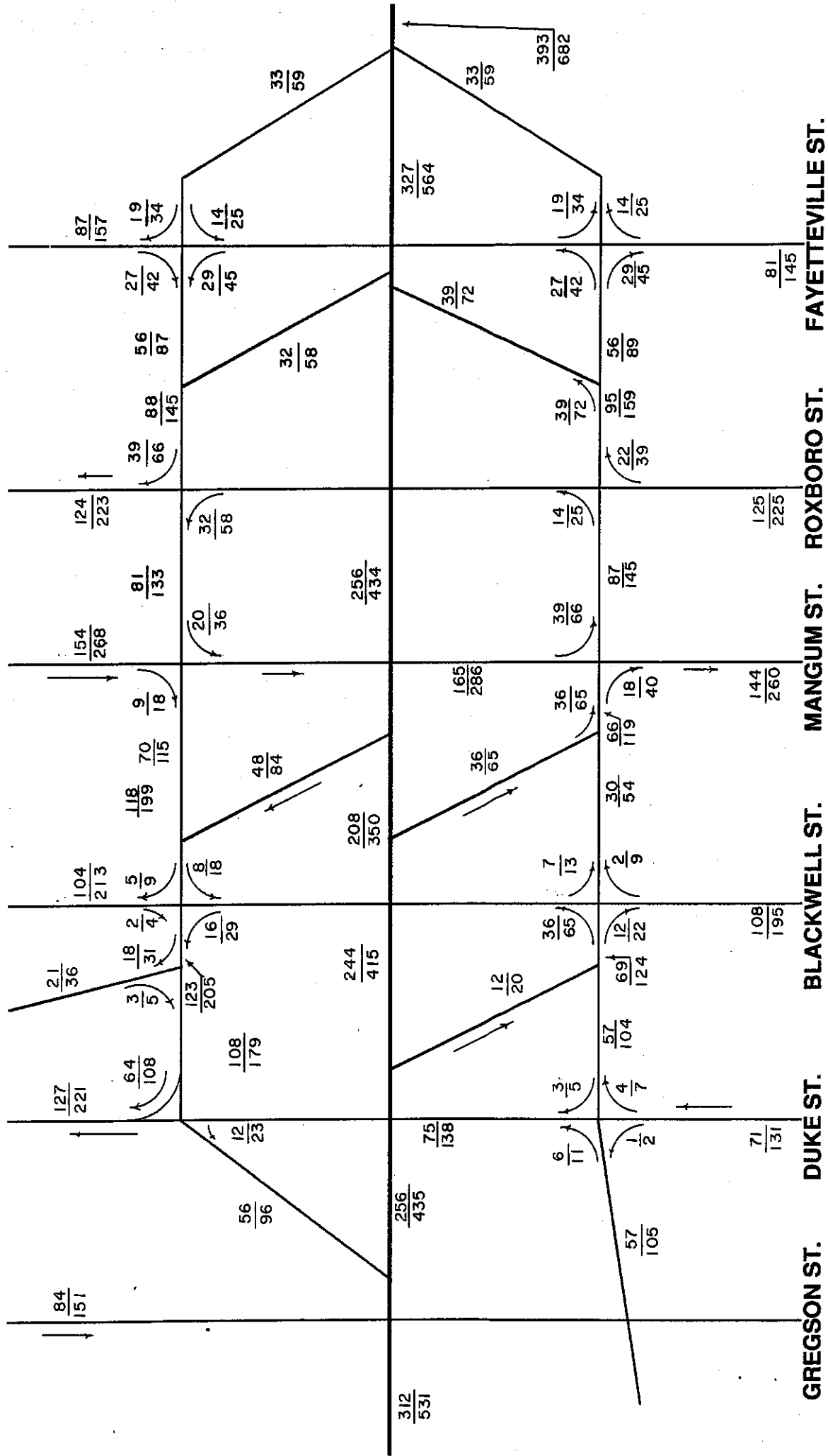


FIG. 4